Technology is revolutionizing the design, delivery, and evaluation of nursing education. As technology is incorporated into educational programs, nurse educators are faced with new challenges related to development, implementation, and testing. In the first article of this month’s issue of the *Journal of Nursing Education* (Ostrow and DiMaria-Ghalili), the graduate faculty in a rural West Virginia nursing institution describe their implementation of distance education courses using a new form of instructional technology, Webcasting, to deliver presentations via the Web to reach their students. Other articles in this issue describe the use of simulation technology to enhance undergraduate education (Medley and Horne) and the use of a hand-held electronic device to increase learning related to performing and documenting physical assessments, data input and transmissions, and autonomous clinical practice (Ndiwane). Another type of emerging technology discussed is the use of personal digital assistants (PDAs) as a means to prepare competent nurse professionals to value and seek current information when caring for clients (Miller et al.). These examples clearly demonstrate the educational shift of incorporating technology to provide more student learning opportunities, create innovative teaching practices, and promote current, accurate information retrieval systems for nurses caring for clients.

As new technologies are developed, important questions for nurse educators arise. Not only must they decide how best to implement and use the new types of technology, but they must also determine which teaching-learning practices best apply, how faculty and student development will be enabled, and which outcomes are best achieved by use of the technology. In addition, as educators incorporate new technologies into their instruction, the development and implementation of the process, based on a theoretical model or framework, need to be systematically described and disseminated, so the innovation can be tested and replicated by others.

Web-Based Courses

The Web-based course is a current example of technology being used with an emphasis on educational principles, theory, and good pedagogical design. Web-based courses are perhaps the farthest along in design development, testing, and having a framework for assessing outcomes and practices. National benchmarks for best practices in distance education have been determined based on research evidence in higher education and nursing (Billings, Connors, & Skiba, 2001). This research helps nurse educators become informed about Web-based technology and how it can be effective when driven by the pedagogical goals of the course or program. With proper design of distance education format, learning outcomes can be achieved, socialization can occur, and clinical skills can be learned (Clark, 2004; Jeffries, in press; Nesler, Hanner, Melburg, & McGowan, 2001). In addition to the advantages for students, faculty are afforded multiple alternative worksites, and universities are provided with a wider student audience at lower cost (American Association of Colleges of Nursing, 2000; Larsen, Logan, & Pryor, 2003).

Simulation

Although not yet as formally developed in terms of evidence-based pedagogical design and outcomes as Web-based courses, increasingly sophisticated simulations are introducing advanced technologies into nursing classrooms. Simulations have been used for years, but new technologies provide opportunities for more realistic replications for teaching problem solving and clinical reasoning skills in non-threatening environments. The use of
new technologies in simulations gives rise to issues such as the need for a framework to guide simulation development, best practices for implementing this technology, and the need for rigorous research designs to evaluate learning outcomes.

In their article in this issue, Medley and Horne describe concerns associated with using the simulations and simulators. Too often the equipment is purchased without a plan or faculty willing to implement the innovative teaching-learning practices. Educators and researchers need to join forces to develop more rigorous research studies testing simulation outcomes. Nursing organizations, commissions of higher education, accrediting bodies, academic institutions, and schools of nursing are seeking answers to questions about simulation design and development, teaching-learning practices, implementation process, and learning outcomes associated with this method of instruction, just as they addressed similar questions related to distance education only a few years ago.

Nurse educators are currently conducting national, multisite studies to address these questions, with the goal of enhancing the understanding and educational usefulness of simulations in nursing. For example, when simulations are used as a teaching-learning intervention, are learning outcomes improved? When developing a simulation, what are the important design features of a well-executed simulation in nursing education? Are simulations used as preparation for or replacement of clinical experiences? How does the use of simulations contribute to advancing nursing into the next generation?

Conclusion

The incorporation of new technology, alone or in combination with other methods, reflects the direction of nursing education. Different types of technology are being used in today’s classrooms, laboratories, and/or clinical sites to promote more realism in the practice environment, enhance learning outcomes, and promote safe patient care environments in clinical practice. To keep up with our changing society and the technological advances in nursing practice, nurse educators will have to be creative in developing new, innovative models of teaching. Nurse educators will also need be mindful of educational research, as these new methods are incorporated into the teaching-learning process.

Just as nursing practice has changed dramatically during the past decade, so has the approach to nursing education. Educators need to make certain they are informed about the possibilities of new technology, its usefulness in enhancing student education, and the progress of educational research efforts conducted to guide new models of nursing education.

References

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